

We claim:

1. A method for detection of Anthrax (*Bacillus anthracis*), comprising:
  - a) irradiating at least one Anthrax microorganism with light; then
  - b) forming an image of the Anthrax microorganism using Raman shifted light from the pathogenic microorganism; then
  - c) analyzing the Raman shifted light image for patterns characteristic of Anthrax microorganisms.
2. The method of claim 1, where the step of analyzing includes analyzing the strain of the Anthrax microorganism.
3. The method of claim 1, where the step of analyzing includes analyzing the viability of the Anthrax microorganism.
4. The method of claim 1, where the step of analyzing includes analyzing the growth medium in which the Anthrax microorganism has been grown.

5. A method for detection of pathogenic microorganisms, comprising:

- a) irradiating at least one pathogenic microorganism with light; then
- b) forming an image of the at least one pathogenic microorganism using Raman shifted light from the pathogenic microorganism; then
- c) analyzing the Raman shifted light image for patterns characteristic of pathogenic microorganisms.

6. The method of claim 5, where the Raman shifted light from the region passes through a FAST fiber array spectral translator.

7. The method of claim 5, where the Raman shifted light from the region passes through a Fabry Perot angle tuned filter.

8. The method of claim 5, where the Raman shifted light from the region passes through an acousto-optic tunable filter.

9. The method of claim 5, where the Raman shifted light from the region passes through a liquid crystal tunable filter.

10. The method of claim 9, where the Raman shifted light from the region passes through a Lyot filter.

11. The method of claim 9, where the Raman shifted light from the region passes through an Evan's split element liquid crystal tunable filter.

12. The method of claim 9, where the Raman shifted light from the region passes through Solc liquid crystal tunable filter.

13. The method of claim 9, where the Raman shifted light from the region passes through liquid crystal Fabry Perot (LCFP) tunable filter.

14. The method of claim 5, where the Raman shifted light from the region passes through a polarization-independent imaging interferometer.

15. The method of claim 14, where the Raman shifted light from the region passes through a Michelson interferometer.

16. The method of claim 14, where the Raman shifted light from the region passes through a Sagnac interferometer.

17. The method of claim 14, where the Raman shifted light from the region passes through a Twynam-Green Interferometer.

18. The method of claim 14, where the Raman shifted light from the region passes through a Mach-Zehnder Interferometer.

19. The method of claim 5, where the Raman shifted light from the region passes through a tunable Fabry Perot Interferometer.

20. The method of claim 5, where the Raman shifted light from the region passes through at least two filters chosen from the group consisting of Solc, LCFP, Lyot, and Evan's split element filters.

21. The method of claim 5, where the pathogenic microorganisms are anthrax spores.

22. The method of claim 5, where the pathogenic microorganisms are protozoa.

23. The method of claim 5, where the pathogenic microorganisms are cryptosporidia microorganisms.

24. The method of claim 5, where the pathogenic microorganisms are Escherichia coli microorganisms.

25. The method of claim 5, where the pathogenic microorganisms are Escherichia coli 157 microorganisms.

26. The method of claim 5, where the pathogenic microorganisms are Plague (*Yersinia pestis*) microorganisms.

27. The method of claim 5, where the pathogenic microorganisms are Smallpox (*variola major*) microorganisms.

28. The method of claim 5, where the pathogenic microorganisms are Tularemia (*Francisella tularensis*) microorganisms.

29. The method of claim 5, where the pathogenic microorganisms are Brucellosis (*Brucella species*) microorganisms.

30. The method of claim 5, where the pathogenic microorganisms are Clostridium perfringens microorganisms.

31. The method of claim 5, where the pathogenic microorganisms are *Salmonella* microorganisms.

32. The method of claim 5, where the pathogenic microorganisms are *Shigella* microorganisms.

33. The method of claim 5, where the pathogenic microorganisms are Glanders (*Burkholderia mallei*) microorganisms.

34. The method of claim 5, where the pathogenic microorganisms are Melioidosis (*Burkholderia pseudomallei*) microorganisms.

35. The method of claim 5, where the pathogenic microorganisms are Psittacosis (*Chlamydia psittaci*) microorganisms.

36. The method of claim 5, where the pathogenic microorganisms are Q fever (*Coxiella burnetii*) microorganisms.

37. The method of claim 5, where the pathogenic microorganisms are Typhus fever (*Rickettsia prowazekii*) microorganisms.

38. The method of claim 5, where the pathogenic microorganisms are *Vibrio cholerae* microorganisms.

39. The method of claim 5, where the pathogenic microorganisms are chosen from the group of filoviruses (such as Ebola and Marburg viruses), naviruses (such as Lassa fever and Machupo viruses) and alphaviruses( such as Venezuelan equine encephalitis, eastern equine encephalitis, and western equine encephalitis).

40. The method of claim 5, where the pathogenic microorganisms are *Giardia* microorganisms.

41. The method of claim 5, where the pathogenic microorganisms are *Candida albicans* microorganisms.

42. The method of claim 5, where the pathogenic microorganisms are *Enterococcus faecalis* microorganisms.

43. The method of claim 5, where the pathogenic microorganisms are *Staphylococcus epidermidis* microorganisms.

44. The method of claim 5, where the pathogenic microorganisms are *Staphylococcus aureus* microorganisms.

45. The method of claim 5, where the pathogenic microorganisms are *Enterobacter aerogenes* microorganisms.

46. The method of claim 5, where the pathogenic microorganisms are *Corynebacterium diphtheriae* microorganisms.

47. The method of claim 5, where the pathogenic microorganisms are *Pseudomonas aeruginosa* microorganisms.

48. The method of claim 5, where the pathogenic microorganisms are *Acinetobacter calcoaceticus* microorganisms.

49. The method of claim 5, where the pathogenic microorganisms are *Klebsiella pneumoniae* microorganisms.

50. The method of claim 5, where the pathogenic microorganisms are *Serratia marcescens* microorganisms.

51. The method of claim 5, where the irradiating light is in the ultraviolet spectral region with wavelength less than 410 nm.

52. The method of claim 5, where the irradiating light is in the visible spectral region with wavelength less than 780 nm and greater than 410 nm.

53. The method of claim 5, where the irradiating light is in the near infrared spectral region with wavelength less than 2500 nm and greater than 780 nm.

54. The method of claim 5, where the step of analyzing includes analyzing the strain of the pathogenic microorganisms.

55. The method of claim 5, where the step of analyzing includes analyzing the viability of the pathogenic microorganisms.

56. The method of claim 1, where the step of analyzing includes analyzing the growth medium in which the pathogenic microorganisms have been grown.